

# A TALE OF TWO GAS LEAKS: ODOR INVESTIGATIONS

BY FRANK C. MONTAGNA

**R**ECENTLY WE WERE CALLED TO INVESTIGATE AN odor of gas in the basement of a three-story brick building. The truck company entered the building with our gas detector to search for the source. (The detector does not have a digital readout. It just makes noise when gas is present. The more gas, the more noise it makes.)

They encountered a strong smell of gas; the detector was whining away. During the investigation, it was noted that a stovetop burner was turned on but not ignited. Having discovered the source of the leak, a firefighter shut off the burner. I was then called into the building because of an illegal occupancy problem unrelated to the leak. I noticed that although the truck company had vented the apartment, the gas odor was still strong.

How would we know if we had found the only leak? We continued our investigation. The whining of the detector increased when we tested the atmosphere in the meter room, an indication that there was an increased amount of gas at this location. We turned off the meters. When we did this, a sound, previously unnoticed, stopped. Apparently, there was an audible gas leak in the flexible hose that connects the clothes dryer to the gas line. We had not noticed the sound but noted its absence. The flexible connector is a common leak point, especially in the case of older flexible tubing.

After shutting down the meters, we continued to get gas readings at the location where the gas service pipe entered the building. We now suspected an external gas leak filtering into the building at the service pipe entrance. Our combustible gas detector continued to indicate elevated levels of gas in the basement while we were awaiting the response of the utility company and one of our squad units, both equipped with digital meters. A digital meter would indicate what percent of the lower flammable limits of the gas was present; that information would let me know if the atmosphere was hazardous. In the meantime, I took no chances and began evacuating the building.

By the time the utility and our squad company arrived, no natural

gas could be detected. The odor had dissipated. The gas had finally vented from the building. Although no natural gas was present, the utility worker informed me that he detected high levels of carbon monoxide (CO) coming into the building at the area where the gas service line entered the building. He thought there might be an electrical manhole fire nearby and that the CO was seeping in by traveling along an underground electrical conduit from the manhole into the building.

There was no manhole fire, so that could not be the source. I asked the utility worker what gas would trick his meter into thinking it sensed CO. He said hydrocarbon vapors could do that. He put a hydrocarbon filter on the meter and tested the area again. This time his meter did not pick up CO at all. Apparently, some hydrocarbon liquid was put into a nearby sewer, and the fumes were now seeping into the building from a crack in the sewer line that entered the building near the gas pipe entrance. Once the hydrocarbon filter was put on the meter, there were not enough fumes to register; without the filter, however, there were enough fumes to trick the meter into thinking that CO was present.

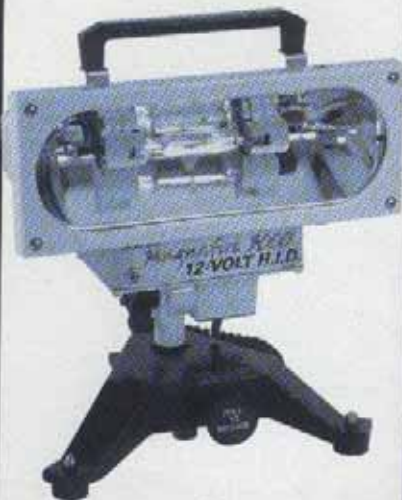
There is more to combustible gas detection than meets the eye. It is not just turning on the meter and reading the digital display. Meters can be tricked by a number of conditions that may cause them to give misleading readings. It is important to know your meter's capabilities and limitations.

## ANALYSIS

OK, we had a gas leak. No, we had two gas leaks. No, we had three gas leaks. No, we had two gas leaks and a burning manhole with an accompanying CO problem. No, we had two gas leaks and a hydrocarbon vapor problem. Often, routine responses can be difficult to resolve and require detective work. We could easily have left the scene of this gas leak after shutting down the stovetop burner. We believed that we had resolved the problem by shutting the stovetop burner. If we had left at that point, we might have had to return later to an explosion and a fire. Any time there is a gas leak in a building, we must thoroughly check the area with a combustible gas meter. Investigating without a meter is just not good enough. If your unit doesn't have a meter, call one that does. A digital meter is the best choice at these incidents. Digital meters tell you not only that gas is present but also if the gas is at or approaching dangerous levels. A multigas meter will alert you to other gases that may be present or, in the case of oxygen, whether its level is lower or higher than normal.

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## **A Tale of Two Gas Leaks: Odor Investigations**

We are often called to homes and places of business when the occupants smell or think they smell natural gas. Sometimes it turns out to be a natural gas leak; other times, the call is the result of some other odor such as sewer gas seeping in through an open trap, a spilled flammable liquid, fumes from a floor that recently had polyurethane applied, an odor from an adhesive, or even the odor of burning incense.

When we are called, we try to identify and locate the source of the reported odor. Sometimes we recognize the odor right away. After having responded to hundreds of reported odor calls, we have developed a talent for recognizing many of the most common odor sources. Other times, we

els of natural gas for CO. A combustible gas meter is needed to detect the deodorized natural gas. If you have a CO meter, bring it along on your odor investigations. Carbon monoxide, which is odorless, might be present in addition to whatever is creating the reported offending odor.

Don't commit all your personnel to searching for the leak in the structure. Keep some outside in reserve. Often, as you search, you will become desensitized to the odor you are trying to locate. Now is the time for your reserve people to take up the search with their fresh noses and for the first team to step outside to allow their olfactory senses to clear. You may have to rotate your people if the search is extended. If you or

**BEFORE YOU DECIDE THERE IS NO DANGER,  
THAT NO ACTION NEED BE TAKEN, AND THAT  
THE INCIDENT IS CLOSED, YOU MUST BE  
CERTAIN THAT YOU DID ALL YOU COULD  
TO LOCATE THE SOURCE OF THE ODOR.**

smell nothing. The odor may have dissipated; we may not smell it because the caller's sense of smell might be sharper than ours, the odor might be intermittent, or there has never been an odor. There are many possibilities; for example, the caller might have imagined the odor or might be using the firefighters' presence as a means of annoying the landlord with whom he may be disputing.

Whatever the cause, we must investigate. For reported odors, it is prudent to bring in whatever gas detectors or meters you carry. Naturally, a combustible gas meter is necessary; if it is a multigas meter, all the better. Natural gas can have its odorant, mercaptan, scrubbed out, if the gas is passing through a sandy soil before it enters the structure. When a leak originates outside of a structure, the leaking gas can migrate great distances, underground, into the home. During this migration, the odorant can be scrubbed out of the natural gas. In this case, the gas might be present but may be undetectable by the sense of smell. A homeowner's semiconductor carbon monoxide alarm (the type that plugs into the wall outlet) can be tricked just as the utility worker's combustible gas detector. If the odorant has been scrubbed out, the CO detector may mistake high lev-

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## A Tale of Two Gas Leaks

yourself if it should become necessary.

If you have an odor you feel might be dangerous, whether toxic or flammable, and you can't find a source, get help. You may need the assistance of your haz-mat unit, the utility, or a governmental agency. You may need EMS to check out or treat the occupants.

Always notify your gas utility of any gas leak and of all valves you shut down. Once a leak is found and a valve shut, the utility should check the entire system for additional leaks. In the incident described above, when we closed the valve, we may have solved the problem or we might have missed a second gas leak somewhere in the piping. It is up to the utility and the occupant to ensure that, in fact, there are no additional leaks and that the gas system is safe before it is turned back on. Firefighters are not equipped or trained to conduct this type of extended investigation; nor is it our responsibility. Never open a gas meter or valve once you have shut it down. Notify the utility; let it determine when, how, or if service should be restored.

When you are the incident commander, you are responsible for the public's safety. Before you decide there is no danger, that no action need be taken, and that the incident is closed, you must be certain that you did all you could to locate the source of the odor. Use all of the tools at your disposal and all of your experience to locate the odor's source.

As previously mentioned, there will be times when you cannot locate the source. This is where the art of firefighting comes in. You will have to make a judgment call concerning the presence or absence of a hazard. Base that call on your meter readings, information you gather at the scene, and your experience and training. Your department should provide you with the necessary meters and tools and the appropriate training to use them effectively and interpret the readings they register. The training must be ongoing. Never miss an opportunity to train your subordinates or yourself. Trained firefighters will be able to collect more complete and accurate information for you and will better understand the meaning of the information they gather. The overall result will be better decisions by the incident commander. Experience, unfortunately, can be gained only one day at a time. The more you have, the better your decisions will be. ■

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